



TITLE OF THE INVENTION

LIQUID DETECTING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a liquid detecting apparatus which constitutes a viscometer or density meter for detecting density of a measuring liquid, and more particularly to a liquid detecting apparatus in which a vibrating element composed of a piezoelectric vibrating plate is used as a vibrating source.

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2. Related Art

[0002] Patent documents 1 and 2 disclose a liquid detecting apparatus comprising a liquid detecting element located at a lower end of a vibration shaft and immersed in a measuring liquid and a vibrating element located at an upper end of the vibration shaft and for vibrating the vibration shaft in a circular direction about the axis of the vibration shaft, wherein a piezoelectric vibrating plate capable of conducting a bending vibration is used as the vibration detecting element and the vibration shaft is vibrated in the circular direction by the bending vibration of the piezoelectric vibrating plate, thereby vibrating the liquid detecting element in the circular direction in the measuring liquid.

[0003] In the liquid detecting apparatus as represented by the above patent documents 1 and 2, the inner end edges of the respective piezoelectric vibrating plates are rigidly connected to the vibration shaft on